

WE CLAIM:

1. A hydraulic braking system for supplying a braking output to a vehicle having at least one wheel, the braking system comprising:
 - (a) a primary valve assembly configured to receive a manually controlled input that varies the braking output, the primary valve assembly including:
 - (i) a first spool valve configured to vary the braking output according to the manually controlled input; and
 - (b) a secondary valve assembly integral with the primary valve assembly, the secondary valve assembly being configured to receive input signals from a programmable electronic controller, the secondary valve assembly including:
 - (i) a second spool valve configured to operate with the primary valve assembly; and
 - (ii) an actuator for engaging and actuating the second spool valve according to the input signals received from the programmable electronic controller such that the second spool valve modulates the braking output produced by the primary valve assembly.
2. The hydraulic braking system of claim 1, wherein:
 - (a) the first spool valve is positionable between a first position, a second position, and intermediate positions between the first and second positions;
 - (i) the first position providing fluid communication between at least one of the wheels and a first pressure source;
 - (ii) the second position providing fluid communication between at least one of the wheels and a second pressure source; and
 - (iii) the intermediate positions restricting fluid communication between the vehicle wheels and the first and second pressure sources; and

(b) the second spool valve is positionable between a first position, a second position, and intermediate positions between the first and second positions;

- (i) the first position providing fluid communication between the primary valve assembly and the first pressure source;
- (ii) the second position providing fluid communication between the primary valve assembly and the second pressure source; and
- (iii) the intermediate position restricting fluid communication between the vehicle wheels and the first and second pressure sources;

- (A) the second spool valve being constructed and arranged to modulate between the secondary valve assembly first and intermediate positions such that the secondary valve assembly pilot assists the primary valve assembly to intensify the braking output provided by the primary valve assembly when the actuator urges the second spool valve to the second position.

3. The hydraulic braking system of claim 2, wherein:

- (a) the second spool valve further being constructed and arranged to modulate between the secondary valve assembly second and intermediate positions such that the secondary valve assembly decreases the braking output produced by the primary valve assembly.

4. The hydraulic braking system of claim 1, wherein:

- (a) the actuator is a solenoid actuator having a coil and an armature for engaging and actuating the second spool valve according to the input signals received from the programmable electronic controller such that the second spool valve modulates the braking output produced by the primary valve assembly.

5. The hydraulic braking system of claim 1, wherein:

(a) the programmable electronic controller is configured to receive input from one or more vehicle control systems such that the secondary valve assembly modulates the braking output produced by the primary valve assembly according to preset values.

6. The hydraulic braking system of claim 5, wherein:

(a) the vehicle control system is an anti-lock brake system.

7. The hydraulic braking system of claim 5, wherein:

(a) the vehicle control system is a traction control brake system.

8. The hydraulic braking system of claim 1, wherein:

(a) the programmable electronic controller is configured to receive input from a serial control device such that the secondary valve assembly modulates the braking output produced by the primary valve assembly in real-time.

9. The hydraulic braking system of claim 1, wherein:

(a) the programmable electronic controller is configured to receive input from one or more electronic sensors such that the secondary valve assembly modulates the braking output produced by the primary valve assembly in real-time.

10. An electronically enhanced brake valve for controlling a braking output to a vehicle having at least one wheel, the brake valve comprising:

(a) a primary valve assembly configured to receive a manually controlled input that varies the braking output, the primary valve assembly including:

(i) a first spool valve configured to vary the braking output according to the manually controlled input; and

(b) a secondary valve assembly integral with the primary valve assembly, the secondary valve assembly being configured to receive input signals from a programmable electronic controller, the secondary valve assembly including:

- (i) a second spool valve configured to operate with the primary valve assembly; and
- (ii) a solenoid actuator having a coil and an armature for engaging and actuating the second spool valve according to the input signals received from the programmable electronic controller such that the second spool valve modulates the braking output produced by the primary valve assembly.

11. The brake valve of claim 10, wherein:

- (a) the first spool valve is positionable between a first position, a second position, and an intermediate position between the first and second positions;
 - (i) the first position providing fluid communication between at least one of the wheels and a first pressure source;
 - (ii) the second position providing fluid communication between at least one of the wheels and a second pressure source; and
 - (iii) the intermediate position restricting fluid communication between the vehicle wheels and the first and second pressure sources; and
- (b) the second spool valve is positionable between a first position, a second position, and an intermediate position between the first and second positions;
 - (i) the first position providing fluid communication between the primary valve assembly and the first pressure source;
 - (ii) the second position providing fluid communication between the primary valve assembly and the second pressure source; and

(iii) the intermediate position restricting fluid communication between the vehicle wheels and the first and second pressure sources;

(A) the second spool valve being constructed and arranged to modulate between the secondary valve assembly first and intermediate positions such that the secondary valve assembly pilot assists the primary valve assembly to intensify the braking output provided by the primary valve assembly when the armature urges the second spool valve to the second position.

12. The brake valve of claim 11, wherein:

(a) the second spool valve further being constructed and arranged to modulate between the secondary valve assembly second and intermediate positions such that the secondary valve assembly decreases the braking output produced by the primary valve assembly.

13. The brake valve of claim 10, wherein:

(a) the programmable electronic controller is configured to receive input from one or more electronic sensors such that the secondary valve assembly modulates the braking output produced by the primary valve assembly according to preset values.

14. The brake valve of claim 10, wherein:

(a) the programmable electronic controller is configured to receive input from one or more vehicle control systems such that the secondary valve assembly modulates the braking output produced by the primary valve assembly according to preset values.

15. The brake valve of claim 14, wherein:

(a) the vehicle control system is an anti-lock brake system.

16. The brake valve of claim 14, wherein:
 - (a) the vehicle control system is a traction control brake system.
17. The brake valve of claim 10, wherein:
 - (a) the programmable electronic controller is configured to receive input from a serial control device such that the secondary valve assembly modulates the braking output produced by the primary valve assembly in real-time.
18. The brake valve of claim 10, wherein:
 - (a) the programmable electronic controller is configured to receive input from one or more electronic sensors such that the secondary valve assembly modulates the braking output produced by the primary valve assembly in real-time.
19. The brake valve of claim 10, wherein:
 - (a) the first pressure source is system pressure; and
 - (b) the second pressure source is ambient pressure.